इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”
Mazdoor Kisan Shakti Sangathan
“The Right to Information, The Right to Live”

“पुराने को छोड नये के तरफ”
Jawaharlal Nehru
“Step Out From the Old to the New”

IS 15473 (2004): Blow Moulded HDPE Containers for Packaging of Edible Oils [PCD 21: Plastics Containers]

“ज्ञान से एक नये भारत का निर्माण”
Satyanarayan Gangaram Pitroda
“Invent a New India Using Knowledge”

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”
Bhartṛhari—Nītiśatakam
“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA
JURIS
NON EXCUSAT

PROTECTED BY COPYRIGHT

भारतीय मानक

खाद्य तेलों की पैकेजबंदी के लिए एचडीपीई के ब्लो-संचकित धारक — विशिष्टि

Indian Standard

BLOW MOULDED HDPE CONTAINERS FOR PACKAGING OF EDIBLE OILS — SPECIFICATION

ICS 13.060.20; 55.100; 83.140.01

© BIS 2004

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

August 2004

Price Group 3

Plastics Containers Sectional Committee, PCD 21

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Plastics Containers Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

Edible oils are presently packed either in flexible pouches, tin containers or plastics blow moulded containers. Indian Standards have already been formulated for flexible pouches and tin containers [*see* IS 12724 : 1989 Flexible packaging materials for packing of refined edible oils — Specification and IS 10325 : 1989 Square tins — 15 kg for ghee, vanaspati, edible oils and bakery shortenings — Specification (*first revision*)]. The recent problems of adulteration of edible oils have prompted the Government to issue order to ban the sale of edible oils in loose form. This decision makes mandatory for the edible oils manufacturers to pack the oil in standard packaging materials. These considerations led the Committee to formulate a separate Indian Standard on packaging of edible oils in blow moulded HDPE containers.

As per the *Standards of Weights and Measures (Packaged Commodities) Third Amendment Rules*, 1994, edible oils, ghee, vanaspati and butter oils may be packed on weight or on volume basis in sizes 50 g/50 ml, 100 g/100 ml, 200 g/200 ml, 500 g/500 ml, 1 kg/1 litre, 2 kg/2 litre, 5 kg/5 litre thereafter in multiples of 5 kg/5 litre. The rule also states that in case packing has been done on mass basis declaration of volume within brackets, and if it is done on volume basis declaration of mass within brackets is to be done.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

BLOW MOULDED HDPE CONTAINERS FOR PACKAGING OF EDIBLE OILS — SPECIFICATION

1 SCOPE

This standard covers the requirements, method of sampling and tests for blow moulded high density polyethylene (HDPE) containers for the packaging of edible oil in quantities of 1 kg, 2 kg, 5 kg, 10 kg and 15 kg if packed on weight basis or 1 litre, 2 litre, 5 litre, 10 litre and 15 litre, if packed on volume basis.

2 REFERENCES

The following standards contain provisions, which through reference in this text constitute provisions of this standard. At the time of publication the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standard indicated below:

IS No.	*Title*
2798 : 1998	Methods of test for plastics containers (*first revision*)
4905 : 1968	Methods for random sampling
7019 : 1998	Glossary of terms in plastics and flexible packaging excluding paper (*second revision*)
7328 : 1992/ ISO 1872-1: 1997	High density polyethylene materials for moulding and extrusion (*first revision*)
7408	Blow moulded polyolefin containers
(Part 1) : 2000	Up to 5 litre capacity (*second revision*)
(Part 2) : 2000	Over 5 litres, up to and including 60 litre capacity (*first revision*)
8747 : 1977	Methods of test for environmental stress-crack resistance of blow-moulded polyethylene containers
9833 : 1981	List of pigments and colourants for use in plastics in contact with foodstuffs, pharmaceuticals and drinking water
9845 : 1998	Determination of overall migration of constituents of plastics materials and articles intended to come in contact with foodstuffs — Method of analysis (*second revision*)
10146 : 1982	Specification for polyethylene for its safe use in contact with foodstuffs, pharmaceuticals and drinking water
10951 : 1984	Polypropylene materials for moulding and extrusion (*first revision*)
13360 (Part 9/Sec 4) : 1997/ISO 183 : 1976	Plastics — Methods of testing : Part 9 Optical properties, Section 4 Qualitative evaluation of the bleeding of colourants
14534 : 1998	Guidelines for recycling of plastics

3 TERMINOLOGY

For the purpose of this standard, the definitions given in IS 7019 and the following shall apply.

3.1 Container

The term 'container' shall mean container body, handles and closures and inner seal inclusive.

4 REQUIREMENTS

4.1 Material

4.1.1 *Container Body*

The material used for the container body shall be of HDPE of grade designation conforming to IS 7328. The recommended HDPE grade designation is given in Annex A.

The material shall be of food grade HDPE conforming to IS 10146.

The pigments and colourants used shall be as per the lists and limits described in IS 9833.

4.1.2 *Handle and Closure*

The material used for the handle and closures shall be of HDPE of grade designation PE MAN A57 T200 or PE MAN A57 D090 conforming to IS 7328 or of polypropylene generally of grade designation PP-HM-95-030 - Nat or PP-HC-95-030 - Nat conforming to IS 10951.

Any metals or other suitable materials used shall be rust free and shall not come in contact with the products packed (edible oils); thickness of the rod be as agreed between the purchaser and supplier.

4.1.3 *Inner seal*

The inner seal shall be of food grade plastics/laminates which are heat sealable. It may be in the form of plug/ insert or a diaphragm.

4.2 Manufacturing

4.2.1 The container shall be manufactured by blow moulding. The top closure shall be made by injection moulding. The handle may be integral with the container or may be separately provided.

4.2.2 The container, closure and handle shall be free from any visual defects like warpage, burning, non-uniform colour dispersion or local thinning.

4.3 Capacity

The minimum brimful capacity of a container when checked in accordance with the method prescribed in **5** of IS 2798 shall be as under:

Container Capacity	*Minimum Brimful Capacity*	*Container Capacity*	*Minimum Brimful Capacity*
kg	ml	litre	ml
1	1 160	1	1 040
2	2 300	2	2 070
5	5 700	5	5 130
10	11 500	10	10 350
15	17 500	15	15 750

NOTES

1 The brimful capacity of the container may be calculated on the basis of the specific gravity of edible oil and may vary with the filling process and filling temperature. The purchaser of the container shall specify the brimful capacity according to the method and temperature of his filling.

2 The capacity other than mentioned above may be as agreed between the purchaser and the supplier.

4.4 Container Mass

4.4.1 The mass of the container shall be as specified by the purchaser. The mass of the lid, handle, when provided separately shall not be included in the mass of the container. The tolerance on the container mass shall be as follows:

Container Capacity kg or litre	*Tolerance Nominal Mass* percent
1	±7
2	±7
5	±4
10	±4
15	±4

4.4.2 Tolerance on the nominal specified mass of the lid and the handle checked individually shall be ±5 percent.

4.5 Shape and Dimensions

Shape and dimensions of the container shall be according to IS 7408 (Part 1) for containers up to 5 litre capacity and IS 7408 (Part 2) for containers over 5 litre capacity. Any specification other than this shall be agreed between the purchaser and the supplier. The dimensional measurements shall be done in accordance with the methods prescribed in **4** of IS 2798.

4.6 Tolerance on Dimensions

The tolerance on various dimensions shall be as under.

4.6.1 *Container Overall Height*

Tolerance of the container overall height shall be ±1 percent.

4.6.2 *Container Height to Neck Face*

Tolerance of the container height to neck face shall be ±1 percent.

4.6.3 *Internal Neck Diameter*

Tolerance of the internal neck diameter shall be as agreed between the purchaser and the supplier.

4.6.4 *External Neck Diameter*

Tolerance of the external neck diameter shall be as agreed between the purchaser and the supplier.

4.6.5 *Thread Diameter*

The length of the thread in contact between the cap and the neck shall be minimum one and half turns. The tolerance on thread diameter shall be as agreed between the purchaser and the supplier.

4.6.6 *Neck Height*

The tolerance of the neck height shall be within ±2 percent.

4.6.7 *Non Threaded Necks*

Non threaded necks shall be in such a way as to ensure that the containers are complete with the performance requirement of this standard when the appropriate enclosures are supplied.

4.7 Wall Thickness

The minimum wall thickness at any point of the container shall not be less than 0.3 mm for containers of 1 and 2 kg or 1 and 2 litre capacity, 0.5 mm for containers of 5 and 10 kg or 5 and 10 litre capacity and 0.7 mm for containers for 15 kg or 15 litre capacity.

NOTE — The wall thickness of the containers is subjected to variation over the total area. Thinner sections generally occur at the top and bottom of the containers.

4.8 Tests

4.8.1 *Product Compatibility*

The test shall be undertaken to determine the significance of factors such as permeation, absorption, extraction, softening, brittleness, colour bleeding and deterioration of the product where these are likely to apply. Such test shall be subjected to agreement between purchaser and supplier and IS 2798 may be considered as a guideline for conducting this test.

4.8.2 *Closure Leakage Test*

The containers filled with water at ambient temperature and closed tight with the closure with inner seal heat-sealed to its mouth, shall not show any leakages when held vertically upside down for 10 min. The containers shall be kept on a blotting paper in upside down position and any leakages observed shall be noted.

4.8.3 *Drop Impact Test*

The containers filled with water at standard temperature of 27 ± 2°C and closed tight with the closure with inner seal heat-sealed to its mouth shall not show any sign of rupture or leakage on the part of container body, closure, handles and the inner seal, when tested in accordance with the method described in **8** of IS 2798.

The drop height of the containers up to 5 kg or 5 litre capacity shall be 1.2 m, for containers of 10 kg or 10 litre capacity 1.0 m and for containers of 15 kg or 15 litre capacity, it shall be 0.5 m respectively.

4.8.4 *Stack Load Test*

The containers shall not show any deformation likely to reduce their strength, cause leakage or reduction in effectiveness of the closure or cause instability in stacks when tested in accordance with the method described in 9 of IS 2798.

4.8.5 *Handle Pull Test*

The containers provided with the handle when subjected to a vertical pull of double its nominal filling capacity for 10 min shall not show any damage to the handle or the hinges or crack along the body.

4.8.6 *Ink Adhesion for Printed Containers*

The printed containers when tested in accordance with the method described in **13** of IS 2798 shall not show any significant removal of the print from the container surface and the print shall be legible to the naked eye after the test.

4.8.7 *Product Resistance of Printed Containers*

The printed containers when tested in accordance with the method described in **14** of IS 2798 shall not show any significant removal of the print from the container surface and the print shall be legible to the naked eye after the test.

4.8.8 *Overall Migration*

Representative samples of containers shall be subjected to overall migration test with *n*-heptane at 38 ± 1°C for 30 min according to the method given in IS 9845. The maximum extraction value of the material shall not exceed 10 mg/dm^2 and 60 ppm.

4.8.9 *Colour Bleeding Test*

The printed containers shall be tested for colour bleeding according to the method described in IS 13360 (Part 9/Sec 4). The test samples shall not show any colour bleeding legible to the naked eye after the testing.

4.8.10 *Environmental Stress Crack Resistance*

The containers when tested in accordance with method I of IS 8747, shall show no evidence of stress cracking or leakages after being kept in an oven for 48 h for edible oils.

4.8.11 *Storage Test*

The storage test shall be carried out both at 38 ± 1°C and 90 ± 2 percent relative humidity (accelerated conditions) and 27 ± 1°C and 65 ± 2 percent RH (standard conditions). The free fatty acid (as percentage of oleic acid), moisture content and rancidity of the contents shall be noted initially and at the end as per schedule given in Table 1 under accelerated and standard conditions.

Table 1 Test Period for Storage Test

Sl No.	Shelf Life (Months)[1]	Accelerated Conditions (Days)	Standard Conditions (Days)
(1)	(2)	(3)	(4)
i)	3	30	90
ii)	6	60	180
iii)	9	90	270
iv)	12	120	365

[1] The period from date of manufacture of 5.1(d), to the date 'best before.....' at 5.1(e).

The containers shall be accepted if there is no delamination, seam failure, print deformation and any oil seepage and the edible oil does not show rancidity or increase in the values of moisture content and free fatty acid above the permissible limits specified in the corresponding Indian Standard on edible oils at the end of 30 days and 90 days under accelerated and standard conditions respectively.

5 MARKING

5.1 Each container shall be permanently marked with the following:

a) Indication of the source of manufacture and trade-mark, if any;

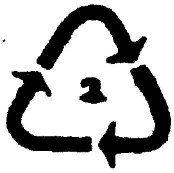
b) Net mass of material to be packed in it;

c) Batch No. or Code No. or otherwise to enable the lot of consignment or manufacture to be traced back from records;

d) Date of manufacture;

e) Best use before............ in line with **4.8.11**;

f) Recycling symbol as given below (*see* IS 14534); and



HDPE
High Density
Polyethylene

g) Any other information required by the purchaser.

5.2 BIS Certification Marking

Each container may also be marked with the Standard Mark.

5.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6 SAMPLING PROCEDURE

Samples of containers shall be drawn and the criteria for conformity determined as described in Annex B.

ANNEX A

(*Clause* 4.1.1)

RECOMMENDED HDPE GRADE DESIGNATION

PE BAN A 50 D 003
PE BAN A 57 D 003
PE BAN A 50 D 006
PE BAN A 57 D 006
PE BAN A 50 D 001
PE BAN A 50 T 012
PE BAN A 57 T 012
PE BAN A 50 T 022
PE BAN A 57 T 022
PE BAN A 50 T 003
PE BAN A 50 T 006
PE BAN A 50 T 003

PE BAN A 57 T 003
PE BAN A 45 T 003
PE BAN C 50 T 012
PE BAN C 50 T 022
PE BAN C 57 T 012
PE BAN C 57 T 022
PE BAN C 50 T 003
PE BAN C 57 T 003
PE BAN C 50 G 045
PE BAN C 50 G 090
PE BAN C 57 G 045
PE BAN C 57 G 090

ANNEX B

(*Clause* 6)

SAMPLING

B-1 SCALE OF SAMPLING

B-1.1 Lot

In any consignment all the containers of the same material, nominal capacity and drawn from a single batch of manufacture shall be grouped together to constitute a lot.

B-1.2 Scale of Sampling

For ascertaining the conformity of the lot to the requirements of this standard, tests shall be carried out for each lot separately. The number of containers to be sampled from a lot shall be in accordance with Table 2.

B-1.3 The containers shall be selected at random from the lot. To ensure the randomness of selection, method given in IS 4905 may be followed.

B-2 CRITERIA FOR CONFORMITY

B-2.1 Visual Examination

The sample containers selected as per col 3 of Table 2 shall be examined for manufacturing conditions (*see* 4.2.2). Any containers failing in one or more of the requirements shall be termed as defective. The lot shall be accepted under this head if the number of defective containers in sample does not exceed the acceptance number given in col 3 of Table 2.

B-2.2 Brimful Capacity, Container Mass and Mass of Handle and Lid

For the purpose of above tests, five containers for the lot size up to 5 000 and 10 containers for lot size above 5 000 shall be selected at random from the samples already drawn according to **B-1.3**. Each of the sample containers shall be subjected to tests for brimful capacity (**4.3**), container mass (**4.4.1**) and the mass of the lid and handle (**4.4.2**). There shall be no failure if the lot is to be accepted under this clause.

B-2.3 Test for Closure Leakage

The number of sample containers to be drawn shall be in accordance with col 5 of Table 2. Each of the sample containers shall be subjected to closure leakage test. The number of failure shall not exceed the acceptance number given in col 6 of Table 2.

B-2.4 Wall Thickness, Handle Pull Test, Ink Adhesion, Product Resistance and Overall Migration

The sub-sample of size as given in col 7 of Table 2 shall be subjected to tests for wall thickness, handle pull test, ink adhesion, product resistance and overall migration tests. No failures shall occur for acceptance of the lot under this clause.

B-2.5 Drop Impact Test and Stack Load Test

One set of sample containers as given in the test methods (**4.8.3** and **4.8.4**) shall be drawn from the lot and these shall be subjected to the respective tests. The sample shall pass the tests for acceptance of the lot in respect of drop impact and stacking requirements.

Table 2 Scale of Sampling and Acceptance Number

(*Clauses* B-1.2, B-2.1, B-2.3 *and* B-2.4)

Sl No.	Lot Size	For Visual Examination (*see* 4.2.2)		For Closure Leakage Test (*see* 4.8.2)		For Wall Thickness, Handle Pull Test, Ink adhesion, Product Resistance and Overall Migration Test (*see* 4.7, 4.8.5, 4.8.6, 4.8.7 and 4.8.8)
		Sample Size	Acceptance Number	Sample Size	Acceptance Number	No. of Samples
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Up to 500	13	1	5	0	2
ii)	501 - 1 000	20	2	8	0	2
iii)	1 001 - 3 000	32	3	13	0	2
iv)	3 001 - 5 000	50	5	20	1	3
v)	5 001 and above	80	7	32	2	5

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publication), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc: No. **PCD 21 (1739)**.

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 *website* : www.bis.org.in

Regional Offices:		**Telephones**
Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	2323 7617 2323 3841
Eastern	: 1/14 C.I.T. Scheme VII M, V.I.P. Road, Kankurgachi KOLKATA 700054	2337 8499, 2337 8561 2337 8626, 2337 9120
Northern	: SCO 335-336, Sector 34-A, CHANDIGARH 160022	260 3843 260 9285
Southern	: C.I.T. Campus, IV Cross Road, CHENNAI 600113	2254 1216, 2254 1442 2254 2519, 2254 2315
Western	: Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400093	2832 9295, 2832 7858 2832 7891, 2832 7892

Branches : AHMEDABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. NAGPUR. NALAGARH. PATNA. PUNE. RAJKOT. THIRUVANANTHAPURAM. VISAKHAPATNAM.

Printed at Simco Printing Press, Delhi